PATTERSON FIELD

By R. M. Davis, Pan American Petroleum Corporation
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DESCRIPTION T 22 S, R 38 W - All 23, 24 & 25 Kearny County

METHOD OF EXPLORATION LEADING TO DISCOVERY

Based on a combination of subsurface interpretation and seismograph data.

DISCOVERY

The discovery well, #1 Patterson, was drilled by Pan American Petroleum Corporation, then Stanolind, in C E/2 SE SE Section 23-22S-38W. A drawdown indicated capacity of 3,964 barrels of oil per day with no water through Morrow sandstone perforations at 4740-52½ was established September 10, 1941. The original bottom hole pressure was 1125 psi as recorded by a drill stem test.

NATURE OF TRAP

The producing interval is from 15 feet of sandstone in the upper Morrowan (Pennsylvanian) series, called the "Patterson sand". Accumulation is primarily the result of a stratigraphic trap, inasmuch as the sandstone lens appears to pinch out in all directions. The sandstone lens is situated on a structural high but the effect upon the oil accumulation is indeterminate.

PRODUCTIVE AREA AND TYPE DRIVE

Production is apparently limited to an area of about 300 acres outlined by dry holes and produces from a gas solution drive.

THICKNESS AND LITHOLOGY OF RESERVOIR ROCK

Thickness of the sand lens ranges in the producing wells from 8 to 15 feet. It is a medium to coarse grained, angular, clear quartz sandstone. There is visual porosity and stain in the samples.

THICKNESS OF PRODUCTIVE ZONE

Gas Column	0
Oil Column	12 feet average

CORE ANALYSIS

A selective core analysis of producing sandstone from Pan American #1 G. O. Patterson, C E/2 SE SE Section 23-22S-38W, is shown below:

Depth	Permeability (Millidarcys)	Effective Porosity (Per Cent)	Oil Saturation % Pore Space	Total Water % Pore Space
4747	597	21.2	26.6	4.8
4749	485	21.1	24.9	5.2
4751	720	17.7	17.8	9.5

CHARACTER OF OIL

API gravity of oil in the Patterson field is 34.0° @ 60° F.

WATER PRODUCTION

All three oil wells were completed free of water. However, each well is making some water at the present time, and as a result Pan American drilled a salt water disposal well, the #1 Gropp Disposal, in C SW/4 Section 24-22S-38W, to the Cedar Hills sandstone (Permian).

The following table is the current 24 hour production test for each well:

Well Name & Section	Oil (bbls.)	Water (bbls.)
Patterson #1 - Section 23	70	6
Gropp #1 - Section 24	97	10
Beissel #1 - Section 25	38	12

The following is the results of a production water sample analyzed by the U. S. Bureau of Mines from the #1 Patterson:

Radical	Parts per Million (Milligrams per liter)	Reacting Values in percentage (Palmer)
Calcium	7,450	7.52
Magnesium	1,510	2.51
Sodium	45,400	39.97
Carbonate	0.0	0.0
Bicarbonate	243	0.08
Sulfate	837	0.35
Chloride	86,900	49.57
Total Solids	142,340	100.00

WATER PRODUCTION (Continued)

Resistivity in ohms/M^2	--	60° F.	0.078
		80° F.	0.062
		100° F.	0.054
		120° F.	0.045

COMPLETION TREATMENT

Wells are producing natural through perforations.

REQUIRED SURFACE CASING

From 1,000 to 1,200 feet of surface casing was run on most of the tests in the area.

MARKETING FACILITIES

Oil is being trucked to Century Refining Company's Shallow Water Refinery.

PRODUCTION HISTORY

Month & Year	No. of Prod. Oil Wells	Prod. Per Year BO	Cumulative BO
12/1941	2	8,127	8,127
12/1942	3	32,143	40,270
12/1943	3	42,837	83,107
11/1944	3	30,237	113,344
1/1945	3	5,022	118,366
1/1946	3	32,312	150,678
12/1947	3	73,916	224,594
12/1948	3	38,422	263,016
12/1949	3	30,599	293,615
12/1950	3	28,886	322,501
12/1951	3	29,249	351,750
12/1952	3	28,229	379,979
12/1953	3	34,722	414,701
12/1954	3	31,298	445,999
12/1955	3	39,520	485,519
12/1956	3	40,532	526,051
12/1957	3	36,898	562,949
5/1958	3	14,314	577,263

AVERAGE WELL COST

The average cost to drill and equip a producing well in the Patterson field was $48,000 in 1942.